


ACADEMIC PAPER

COVID-19: Assessment of knowledge and awareness in Indian society

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COVID-19, which was initiated regionally at Wuhan of China, has become a global pandemic by infecting people of almost all the world. Human civilizations are facing threat for their survival and livelihood. No country are getting any substantial relief and solution from this pandemic rather to convince their citizens to make aware and taking precaution by changing their living style. In view of this, this study attempted to assess the awareness, threat, symptoms and its prevention among people of India about the COVID-19. A total of 522 responses from all over India were received. The respondents have adequate awareness for COVID-19 outbreak and its preventive measures, out of total, 98% (513) answered that the virus spreads from one person to another, 95% (494) answered that the disease is caused by a virus. Peoples understand the importance of social distancing and other preventive measures prescribed by the government with good attitude for coronavirus. Peoples are following trusted sources for corona information, having confidence to defeat disease but showed their concern for corona threat, are aware about the virus, its common symptoms and prevention, govt. testing and medical facilities. Principal component analysis was used to identify the latent dimensions regarding people's preventive measures and was found that they are majorly adopting three methods, that is, lockdown, naturopathy and social distancing. This study will help government and peoples to understand and handle this coronavirus pandemic effectively and in prevention of COVID-19, which is crucial for the awareness of society in coming time.

1 | INTRODUCTION

COVID-19 started from one city of China in December 2019, but in a short span of time, it covered almost all over the world (WHO, 2020b). Nearly 216 countries of the whole world are struggling for their civilization and livelihood against the coronavirus pandemic. On January 11, 2020, China declared first death of their 61 years old citizen due to COVID-19, who was exposed to the seafood market (WHO, 2020b), but now death reached exponentially to 357,736 on 29th May 2020 (WHO, 2020a).

On February 11, 2020, WHO announced this coronavirus disease as COVID-19 (WHO, 2020c) and pandemic on March 11, 2020, after reaching the virus infection to 114 countries across the world.

COVID-19 and SARS coronavirus are similar and because it is becoming a big threat to human civilization as consequences, online awareness programs were initiated and conducted worldwide by WHO (2020c).

Proper strategies and funds were set up by WHO globally to protect the countries with special focus to poor and weaker health infrastructure developing countries. The aim was to reduce the virus communication in society, dissemination of crucial information, providing proper healthcare and to minimize social and economical loss. WHO also focused on establishing an easy and effective diagnostic system to prevent infection (WHO 2020c).

To prevent the infection socially, the lockdown was imposed globally, which resulted in the halt of all economic and social activity in society. This led to cease global supply chains badly resulting in the

global economy in bad shape (Ebrahim, Ahmed, Gozzer, Schlagenhauf, & Memish, 2020). In India, the Central Government also imposed a nationwide lockdown for the first time on March 22, 2020 and continued it up to till date, that is, on May 30, 2020. All transport, manufacturing, hotel industry, educational sector, service industry and so forth were closed immediately, people were left to remain as to where they were at the time of lockdown announcement and during lockdown people started working from home, school and colleges classes are running online, a large number of people shifted on a digital platform (McCloskey et al., 2020).

But on May 30, 2020, this situation of coronavirus disease (COVID-19) outbreak has become worse, as it contains 5,704,736 confirmed cases, 357,736 confirmed deaths across 216 countries. India also has 165,799 confirmed cases with 4,706 casualties (WHO, 2020d).

Now it is very clear that COVID-19 is creating very disaster effects globally with India, people are getting panicked, emotionally unsecured, depressed and in a stage of confusion, unaware about facilities provided by the government, regarding reliable news sources, symptoms of COVID-19 and its prevention with the cure.

Some parts of the North East, India people are taking coronavirus infection as a social stigma, so as a consequence people are hiding their illness and showing their unwillingness to approach hospitals. In this connection, WHO are trying their level best to offer technical guidance and solving public queries, to mitigate their fear, social discrimination and stigma regarding COVID-19 (WHO, 2020c). On the counterpart, our Indian government is also making aware of the people by disseminating information through various reliable sources and providing medical facilities and trying to reduce the losses due to coronavirus. But, in India, we have a very huge dense population without well-established medical facilities, which is a matter of concern Sohrabi et al. (2020); Surjadi & Surja (2019); Sharma, Singh, Agrawal, & Sharma, 2020). Large numbers of people are illiterate, isolated, migrants, live remotely and are below the poverty line, struggling hard for their daily needs are raising the government's concern during the lockdown. Migrant workers are bound to migrate from one state to their home without any proper transport facilities and precaution such as a face mask, social distancing, meal, cleanliness, hygiene, which are triggering to increase more infection in society. Amid the above havoc situation, the anxiety and worries among society are at the top, people who are kept in quarantine centers at isolated places are also feeling serious uneasiness, discomfort, irritability, ignored and in traumatic stress (Li et al. (2020)). Many celebrities, sportspersons, media persons, politicians, other responsible citizens are trying to aware and change the attitude of the public, to take self and families protection and motivating them to avail medical facilities by cooperating with medical personnel, which ultimately leads to reducing coronavirus infection in society (Anderson et al. (2020); Wang et al. (2020) & Zhu et al. (2019)). Hence, it is very crucial to study the following factors in the Indian population and their effects in society.

As the cases of infected people are increasing rapidly, this article will help the public and government to plan and decide the strategies for fighting the coronavirus. This article aims to estimate the level of

exposure people get while going to their workplace and number of people they daily interact, what are the trusted source of information in society regarding coronavirus, how serious is the perception of threat for the virus in society, the awareness level of health facilities provided by the government, general awareness about coronavirus, their symptoms for infection and prevention to common people. There is very little research in India covering the above factors, so this study is crucial for planning and adopting the preventive measures by public and government officials during this pandemic. Hence, this study will help in future to design necessary strategies in Indian society to fight against viruses.

2 | METHODOLOGY

Our study was cross-sectional, carried out by a convenience, non-probability sampling technique in India. We adopted this sampling because, due to movement constraints during a lockdown, it was impossible to approach a common man in the population. This technique of convenience sampling, which is a nonprobability sampling technique, allows researchers to select respondents directly from the population as per their convenience. This technique was cost-effective and time-saving. Researchers choose these samples just because they are easy to fix, approach and train. A semistructured questionnaire was developed in straightforward, understandable English by using Google form. The questionnaire was disseminated to known through WhatsApp, e-mails and other social media platforms. The participants showed enough interest in giving their responses and forwarded it to their contacts, which resulted in getting responses from all over the country. Participants who possess smartphones with internet connectivity have participated in this study, which is very common in modern society. Participants above 15 years and comfortable in English filled the response with willingness. Total, we received 533 responses, but some were filled incomplete, so we eliminated them. Finally, we analyzed 522 responses to draw our results. The respondents' sociodemographic profile was accessed by a questionnaire, which includes gender, age, education, place of residence, domicile, marital status and so forth.

The questionnaire used for the survey have a separate section to know how they commute and interact to peoples, what are their trusted source of information, two questions were to evaluate the threat level of virus, one dichotomous question for awareness about health facility, six questions to estimate awareness level of coronavirus in society, 11 questions for accessing symptoms, 12 questions for perception about prevention from coronavirus. The process of data collection was held from April 11, 2020 to April 28, 2020.

Factor analysis with principal component analysis was used to describe the unobserved underlying latent variables with 12 observed variables (items) of prevention methods adopted by people for coronavirus. Bartlett's test of sphericity was used to check interdependency among the items and KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) was used to inspect the sample sufficiency (Kaiser, 1974). The criterion of Eigenvalue > 1 with factor

loading greater than 0.5 was used to decide the number of factors (latent variables; Kaiser, 1960, Sharma, 1996, Hair, Anderson, Tatham, & Black, 1995). To check the items' internal consistency (reliability index), Cronbach's α (Cronbach, 1984) value was calculated and checked.

3 | RESULTS AND DISCUSSION

This study presents the key findings from a total of 522 respondents (Table 1), with a majority of them, 321 (61.7%) are male and the remaining 201 are female, so we got the balance response gender wise. The vast majority of the respondents, 258 (49.6%) belongs to age range of 15–25 years, 151 (29%) are in age group of 26–35 years, 72 (14%) are lying in a group of 36–45 years, 29 (6%) are in the age range of 46–55 years and rest 11 are above 55 years. Notably, maximum 321 (81.8%) are from urban background and rest 95 are from rural area. In addition, 338 (65%) of our respondents are single or never married, 177 (34%) are married, rest 5 and 2 are divorced and widowed. Most respondents are having postgraduation 265 (51%), 164 (32%) are UG, 57 (11%) are Ph.D., 5 are having diploma and 33 are having other qualifications. So, by education qualification, it is quite confirmed that they have easily understand the question while responding (Figure 1).

Furthermore, a substantial proportion of the respondents 238 (46%) are students, 152 (29%) are private salaried, 63 (12%) are

government salaried, 16 (3%) are having other occupation, 15 (3%) are home makers and 6 (2%) are retired (Figure 2).

This study depicts that the respondents belong to 23 states of our country with maximum representation (193) from Uttar Pradesh, followed by Madhya Pradesh 116 and Uttarakhand 45.

When people were asked about how they commute, the overall result precipitate that a majority of the respondents 227 (44%) commute by two wheelers, which are open to threat of getting infections, 74 (14%) use their personal cars, so they can manage hygiene factors, 54 (10%) use bus, which are prone to maximum exposure, 48 (9%) uses college bus. Thus, we can say that in society, most of the respondents are having the threat of getting exposed for infection (Figure 3).

On the result of question asking regarding the numbers of people they generally interact and do you walk through crowded place daily?, finding of the study indicates that out of total, 199 (38%) respondents reported that they daily interact with more than 10 peoples, 86 (16%) interact to 10 people's daily. 166 (32%) walk regularly through crowded places and 77 (15%) visit occasionally to crowded places, so they are threat to have infection of COVID-19 virus (Figure 4).

On the question of trusted source of information for coronavirus, the study shows that majority of the respondent's 357 (68.3%), trusted on Television (357), 323 (62%) showed their trust on official government Websites and 258 (49%) says Newspaper, so in majority, people trusted on above sources as most authentic sources of news dissemination (Figure 5).

TABLE 1 Demographic information of respondents

Variables	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Age group						
15–25	158	49.2%	103	51.5%	261	50%
26–35	88	27.4%	63	31.5%	151	28.9%
36–45	49	15.3%	20	10.0%	69	13.2%
46–55	18	5.6%	12	6.0%	30	5.7%
Above 55	9	2.8%	2	1%	11	2.1%
Place of residence						
Urban	267	82.9%	160	80%	427	81.8%
Rural	55	17.1%	40	20%	95	18.2%
Marital status						
Divorced/separated	1	0%	4	2%	5	0.9%
Married	115	35.8%	61	30.5%	176	33.7%
Single/never married	205	63.6%	134	67%	339	64.9%
Widow(er)	1	0%	1	0.5%	2	0.4%
Qualification						
UG	111	34.5%	56	28%	167	32%
PG	156	48.4%	106	53%	262	50.2%
Ph.D.	35	10.9%	22	11%	57	10.9%
Diploma	3	0.9%	2	1%	5	1%
Other	17	5.3%	14	7%	31	5.9%

Distribution of Respondents

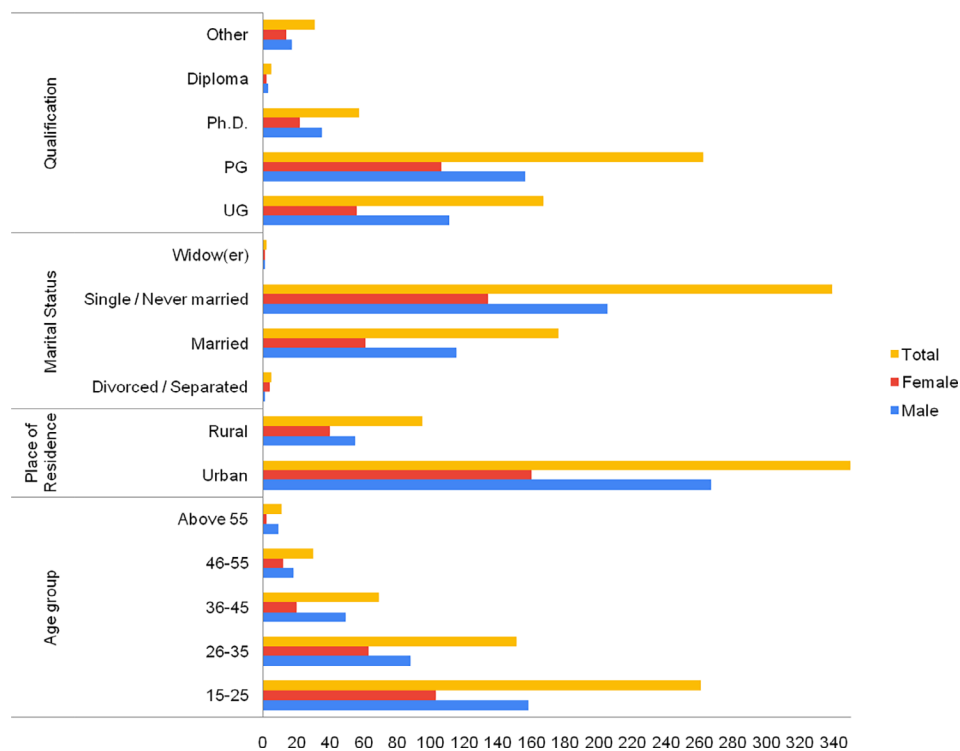


FIGURE 1 Distribution of Respondents

Occupation

522 responses

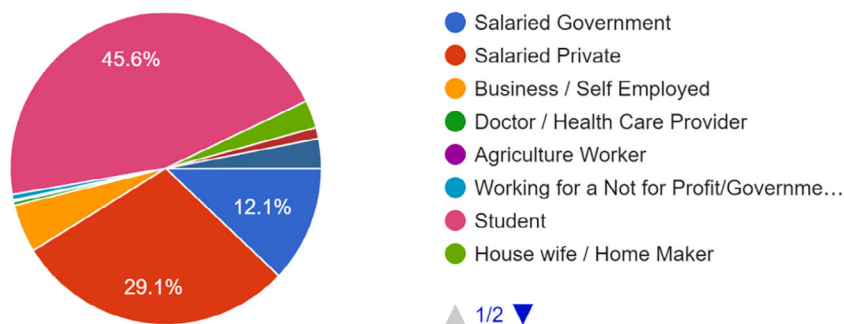


FIGURE 2 Distribution of respondents' occupation

How many people do you interact with per day?

522 responses

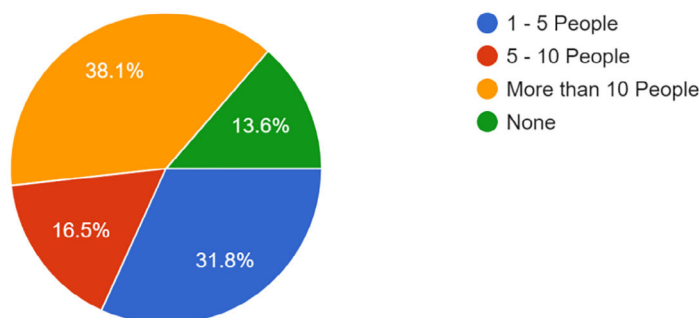
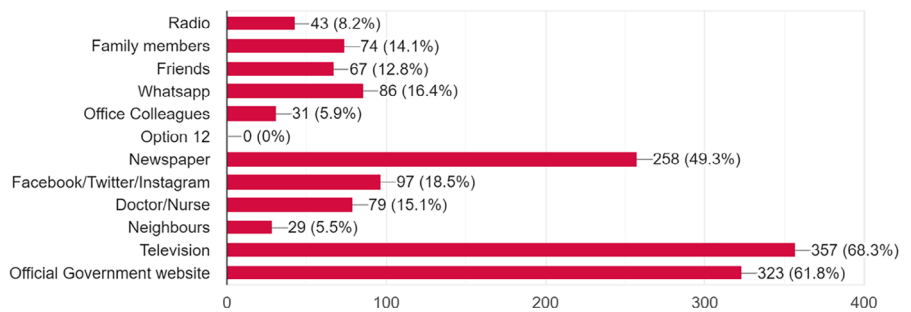


FIGURE 3 Number of Interaction per day

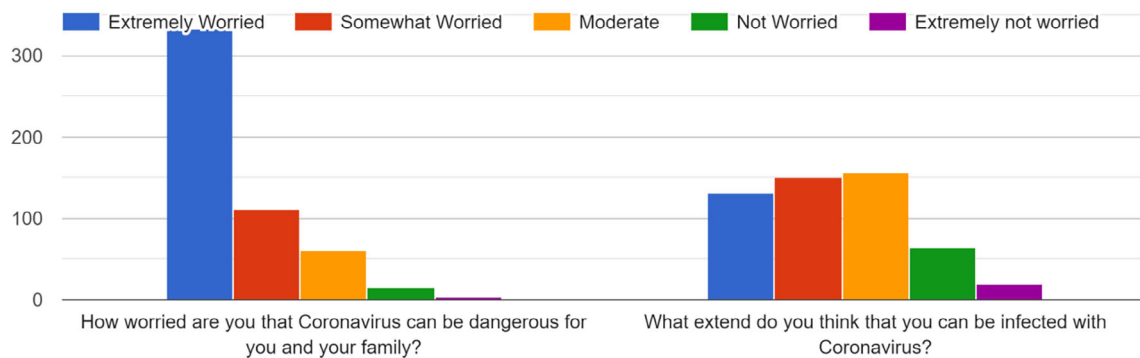
FIGURE 4 Trusted Source of Information about COVID-19

Who is your most trusted source of information about Coronavirus? (Source can be more than One)

523 responses

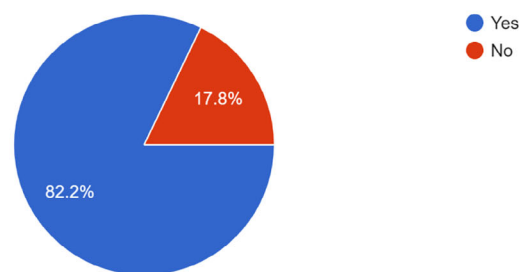


According to you how big threat is Coronavirus to human civilization?

**FIGURE 5** How big is the threat?**FIGURE 6** Awareness about health facilities

Do you know or aware of the health facility where you can get tested for Coronavirus? *

522 responses



When we tried to appraise that how big is this threat of COVID-19 virus to human civilization among the respondents, majority of the respondents 443 (85%) were extremely or somewhat worried for the virus, which is a serious threat. Thus, the government needs to increase the confidence level of people in society (Figure 6).

We also tried to assess the awareness level of health facilities provided by government among society, 429 (82%) respondents reported that they have the information regarding health facility where they can test for coronavirus. It's really a matter of relief that people in society know in case of emergency where they have to

contact. In this matter our government did commendable jobs to aware the people about health facility available.

On asking, what do you know about coronavirus, we came to know that majority number of respondents were adequately aware for basic information of the virus. Out of total participants, 98% (513) answered that virus spreads from one person to another, 95% (494) answered that the disease is caused by a virus. The study showed, 79% (414) respondents are confident that the disease can be prevented and 60% (315) reported that symptoms of COVID-19 virus are worse among diabetic persons (Table 2).

What do you know about coronavirus?	Yes	No	Do not know
It is caused by virus	494	13	15
It can spread from one person to another	513	0	8
It can be prevented	414	43	65
It is the same as common cold	142	333	47
It occurs at certain period of the year	54	334	128
COVID-19 symptoms are worse among diabetic	315	67	140

TABLE 2 Awareness about COVID-19

Source: Data computed through survey (Table 2).

TABLE 3 Common Symptoms

What are the common coronavirus symptoms that you know?	Yes	No
Headache	322	220
Sore throat	452	70
Vomiting	130	392
Persistent cough	456	66
Running nose	366	156
Sneezing	415	107
Muscle ache	255	267
Abdominal pain	145	377
Fever	514	8
Diarrhea	154	368
Feeling tired	394	128

Source: Data computed through survey (Table 3).

The outcome regarding awareness about coronavirus symptoms, study revealed that considerable numbers of respondents were aware of the common symptoms of COVID-19. Most respondents 514 (98%) acknowledge fever as a common symptom of COVID-19, 456 (87%) acknowledge persistent cough, 452 (87%) sore throat, 394 (75%) tiredness and 366 (70%) running nose (Table 3).

3.1 | Perception about prevention from coronavirus

On the question about whether respondents are preventing from virus, out of the total participants, 515 (98.6%) admit that social distancing is crucial to finish virus from transmission. However, 505 (96.7%) admitted washing hands during certain period of time and 510 (97%) felt the need of wearing mask. Almost 501 (96%) agreed that they should avoid face to face meeting (Table 4).

4 | FACTOR ANALYSIS

The investigators applied the factor analysis using principal component analysis as extraction method, with varimax rotation to describe the underlying unobserved latent variables of respondent's perception

for methods to prevent from COVID-19. The objective of factor analysis was to know that what are the major ways through which people's were preventing themselves from virus Table 5.

The KMO measure was $0.834 > 0.5$ (as recommended value of 0.5; Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell, 2007). In addition to this, Bartlett's test of sphericity was significant ($\chi^2 [66] = 1,965.169, p = .000$) (Table 6). In addition, the sample size 522 is more than 10 times the number of variables 12 (Kaiser, 1974), considering N:p ratio to be at least 10, where N is sample size and p is number of variable to be analyzed. All these above results show that factor analysis is suitable and useful for our data. All the items are standardized to ensure the proper interpretation on a common scale. Scree plots and Eigen values were used to extract the suitable number of factor solutions.

Three latent factors were fixed after the analysis of Kaiser normalization criteria (Pett, Lackey, & Sullivan, 2003) and scree plots (Baldridge & Veiga, 2001; Balser, 2007; Balser & Harris, 2008; Cleveland, Barnes-Farrell, & Ratz, 1997; Colella, 2001; Stone & Colella, 1996). These factors are labeled as latent variables F1: **follow the lockdown**, combination of (avoid travelling by any medium, avoid going to market, avoid morning walk, avoid going to office), F2: **naturopathy**, is a combination of (exercise and yoga, eating ginger, garlic, chilies, drinking warm water, avoid going to cold weather) and F3: **social distancing** is combination of (avoid face to face meeting, wash hand and face regularly, wear mask and sanitize, social distancing) and loadings of all about items were greater than 0.5, explaining 34.59%, 14.07% and 10.94% of the variances, respectively. The total variance explained by three factors is 59.16%. Table 6 describes each of the three factors and their factor loading. We also conducted reliability test of the selected 12 factors to test how well they measures what they are intended to measure. How reliable they are to measure latent variable, that is, **perception to prevent from virus?**, value of Cronbach's alpha (α) for above is 0.812 (Table 5), which is good enough to meet the purpose.

5 | LIMITATIONS

This study also has some limitations such as questionnaires filled by people who can understand English and possess smartphones with internet connectivity. These educated population segments are mainly

TABLE 4 Prevention from Corona virus

According to you what are the possible prevention from coronavirus	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Exercise and yoga	212	162	98	41	9
Avoid face to face meeting with people	426	75	12	7	2
Avoid traveling by any medium	374	100	27	16	5
Wash hands and face with soap during certain period of time	451	54	11	5	1
Avoid going to market	346	134	32	7	3
Avoid morning walk	290	137	67	24	4
Avoid going to the office	313	145	50	11	3
Always wearing mask and sanitize hands while stepping out	454	56	8	1	3
Eating ginger/garlic/hot chillies/pepper	205	126	128	46	17
Drinking warm water	313	131	62	13	3
Avoid going out in cold weather	234	120	117	39	12
Social distancing	492	23	5	2	0

Source: Data computed through survey (Table 4).

TABLE 5 Reliability statistics

Test	Value
Cronbach's alpha	0.812
Kaiser–Meyer–Olkin measure of sampling adequacy	0.834
Bartlett's test of sphericity	0.000

TABLE 6 Identified factors from the study and their item loadings

Factor and its constituted items	Factor loading
Factor 1: Follow lockdown	
Avoid travelling by any medium	0.596
Avoid going to market	0.782
Avoid morning walk	0.812
Avoid going to office	0.839
Factor 2: Naturopathy	
Exercise yoga	0.653
Eating ginger garlic chillies	0.847
Drinking warm water	0.805
Avoid going to cold weather	0.646
Factor 3: Social distancing	
Avoid face to face meeting	0.632
Wash hand and face regular	0.683
Wear mask and sanitize	0.675
Social distancing	0.720

Source: Data computed.

restricted to an urban area only, so this cannot be generalized to the whole community. The results drawn from rural people can be different from the findings of our study. The time duration of the data collection was a little bit less.

6 | CONCLUSION

During this coronavirus pandemic, mostly literate urban people were aware of this pandemic, which also similar to the outcome of a study done by (Ray et al., 2020). They are aware of virus infection symptoms such as fever, cough, sore throat, tiredness, running nose and possible infection method from one person to another, so government and celebrities should encourage the ordinary people and boost their morale in this tough time. People showed confidence that disease can be prevented but are concerned for loss due to pandemic. The majority of people in society are commute by their two-wheelers or public bus, prone to infection, so the government should take extra care to sanitize public places and coaches. They have adopted their prevention methods such as lockdown, naturopathy and social distancing, so the government should make necessary arrangements. The majority of people daily interact either to 10 or more people, which is the biggest threat to community transmission, so people should be discouraged from associating with others. Peoples are following trusted sources of information such as TV, newspapers and official government website, so the government should broadcast all relevant information to these platforms. Common men in society are well aware of medical facilities' government initiatives, which are vital to cease the infection. Worries and anxiety among the public regarding COVID-19 disease can be checked and quickly reduce by counseling, their levels to be measured in some research. There is a need to intensify the awareness program during this COVID-19 pandemic, raised by other researchers (Ray et al., 2020).

So this article will help common men to understand the intensity of infection and its symptoms and precaution. It will help common people to understand the threatens level of virus in society and counsel him that it's with everyone, rather than only with him. He will adopt the necessary precautionary measure to avoid infection from illness by getting proper and reliable information from time to time. The government

will also get an idea of common man psychology, problems and worries of ordinary people to formulate a better and effective strategy.

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